

REMARKS

Applicant has reviewed the Final Office Action mailed on April 11, 2006 as well as the art cited. Claim 74 has been added as a new claim. Claims 1-11, 28-38, 43, 44 and 74 are pending in this application.

Summary of Examiner Interview

The Applicant's representative, Jay Wahlquist (Registration Number 55,705) thanks Examiner Hsu for the opportunity to discuss aspects of this case in a personal interview on May 11, 2006.

The pending claims were discussed with respect to the Examiner's rejection of these claims under 35 U.S.C. § 103(a). During the interview, the Applicant's representative discussed possible amendments to the claims with Examiner Hsu. In particular, the Applicant's representative discussed specifying that the communication link referred to in the claims (e.g. claim 1) is a twisted pair.

The Applicant's representatives believe that the substance and scope of the personal interview of May 11, 2006 is accurately captured in the summary above and the arguments below.

Rejections Under 35 U.S.C. § 103

Claims 1-6, 8-11, 28-33, 35-38, 43 and 44 were rejected under 35 USC § 103(a) as being unpatentable over Crowe et al. (U.S. Patent No. 6,928,068) in view of Rawson et al. (U.S. Patent No. 6,028,867). Applicant respectfully traverses this rejection.

Claim 1:

A system for extending the effective distance of digital subscriber line service, the system comprising:

a central office terminal, the central office terminal including:

a data interface; and

a plurality of line units;

at least one communication link, coupled to one of the plurality of line units, that carries signals using digital subscriber line service, wherein each communication link is a twisted pair;

at least one remote access multiplexer, coupled to the at least one communication link, wherein the at least one remote access multiplexer includes a plurality of ports that are adapted to provide digital subscriber line service;

the remote access multiplexer adapted to multiplex signals between the plurality of ports and the at least one communication link; and

wherein the at least one remote access multiplexer is located at a distance from the central office terminal so as to provide digital subscriber line service to user terminals that are located more than 12 kilofeet from the central office terminal.

Applicant asserts that nothing in Crowe or Rawson, taken alone or together, teaches all the claimed limitations of claim 1. In particular, nothing in Crowe or Rawson teaches or suggests “wherein each communication link is *a twisted pair*” (emphasis added). Additionally, Applicant asserts that nothing in Crowe or Rawson teaches or suggests, alone or in combination, that the “at least one communication link . . . carries signals using digital subscriber line service.” In the office action, the Examiner states that “Crowe et al. discloses . . . at least one remote access multiplexer (141).” § 3. In discussing the at least one communication link, the Examiner refers to “the connection between the DSL line card (209) and DSL CPR (107 and 131) and the connection between the DSL line card to the controller (215).” § 5. However, the at least one communication link claimed in claim 1 is coupled between “the at least one remote access multiplexer” and the “central office terminal”. Applicant asserts that nothing in Crowe or Rawson, teaches or suggests using “at least one communication link . . . that carries signals using digital subscriber line service” between the at least one remote access multiplexer and the central office terminal.

Furthermore, DSLAM 141 in Crowe is coupled directly to packet-switched network 119. Crowe, Figs. 1 and 2. However, the at least one remote access multiplexer claimed in claim 1 is coupled to the central office terminal via “at least one communication link . . . wherein each

communication link is a twisted pair” and, as described in one embodiment of the specification, the central office terminal is “coupled to one or more networks.” Specification ¶ 20. Hence, nothing in Crowe or Rawson teaches or suggests the “at least one communication link” between the central office terminal and the at least one remote access multiplexer as claimed in claim 1. For at least the reasons stated above, claim 1 is not obvious over Crowe in view of Rawson. Applicant respectfully requests that the rejection be withdrawn.

Claim 2-11 depend directly from claim 1 and, thus, are allowable for at least the reasons stated above with respect to claim 1. Applicant, therefore, requests that the rejections be withdrawn. In addition, with regards to claim 3, the Examiner acknowledges that Crowe “fails to specifically disclose that the at least one remote access multiplexer is located at a distance from the central office terminal so as to provide digital subscriber line service to user terminals that are located . . . between 12 and 30 kilo-feet from the central office terminal.” § 3. The Examiner refers to col. 3 lines 23-33 in Rawson and asserts that Rawson, “teaches the setup of remote access multiplexer being located at a distance from the central office terminal so as to provide digital subscriber line service to user terminals that are located more than 12 kilo-feet from the central office terminal.” § 3.

However, col. 3 lines 23-33 state “Asymmetric DSL (ADSL) is another one of the DSL group of technologies, which allows such higher bandwidth connections. As an illustration, DMT-modulated ADSL technology can support bandwidth of 6.1 Mbps in the direction leaving the central office and 640 Kbps in the reverse direction. ADSL has the general requirements that *a location* connected with a local loop needs to be within 14,000 feet (approximately 3 miles) of the central office and that the local loop be a continuous metallic path (without electronic transmission equipment) end-to-end (i.e., from home to central office) to a location.” (emphasis added) Rawson continues at lines 34-35 by stating “Unfortunately, not all the *locations (homes and businesses)* meet both the requirements of ADSL.” (emphasis added) Hence, Rawson discusses “requirements that a location [i.e. homes and businesses] connected with a local loop needs to be within 14,000 feet of the central office.” Furthermore, Rawson states “In step 510, a provider installs one or more DSL access multiplexors (DSLAMs) 130 *in central office* 120.” col. 13 lines 23-24 see also Fig. 1. Hence, contrary to the Examiner’s assertion, Rawson does not

teach or suggest “wherein the at least one remote access multiplexer is located at a distance from the central office terminal so as to provide digital subscriber line service to user terminals that are located between 12 and 30 kilofeet from the central office terminal” as claimed in claim 3. For the reasons stated above with regards to claim 1 and for the additional reasons stated here, Applicant requests that the rejection of claim 3 be withdrawn.

Claim 28:

A system for extending the effective distance of digital subscriber line service, the system comprising:

- a central office terminal, the central office terminal including:

- a data interface, and

- a plurality of line units;

- at least one communication link, coupled to one of the plurality of line units, that carries signals using digital subscriber line service, wherein each communication link is a twisted pair;

- at least one remote access multiplexer, coupled to the at least one communication link,

wherein the at least one remote access multiplexer includes:

- a first port, adapted to be coupled to the at least one communication link,

- a plurality of subscriber ports, adapted to be coupled to a plurality of communication links, and

- at least one multiplexer unit, coupled to the first port and the plurality of

- subscriber ports, the multiplexer unit adapted to multiplex signals between the first port and the plurality of subscriber ports; and

wherein the at least one remote access multiplexer is located at a distance from the central office terminal so as to provide digital subscriber line service to user terminals that are located more than 12 kilofeet from the central office terminal.

Applicant asserts that nothing in Crowe or Rawson, taken alone or together, teaches all the claimed limitations of claim 28. In particular, nothing in Crowe or Rawson teaches or

suggests “wherein each communication link is *a twisted pair*” (emphasis added). Additionally, Applicant asserts that nothing in Crowe or Rawson teaches or suggests, alone or in combination, that the “at least one communication link . . . carries signals using digital subscriber line service.” In the office action, the Examiner states that “Crowe et al. discloses . . . at least one remote access multiplexer (141).” § 3. In discussing the at least one communication link, the Examiner refers to “the connection between the DSL line card (209) and DSL CPR (107 and 131) and the connection between the DSL line card to the controller (215).” § 5. However, the at least one communication link claimed in claim 28 is coupled between “the at least one remote access multiplexer” and the “central office terminal”. Applicant asserts that nothing in Crowe or Rawson, teaches or suggests using “at least one communication link . . . that carries signals using digital subscriber line service” between the at least one remote access multiplexer and the central office terminal.

Furthermore, DSLAM 141 in Crowe is coupled directly to packet-switched network 119. Crowe, Figs. 1 and 2. However, the at least one remote access multiplexer claimed in claim 28 is coupled to the central office terminal via “at least one communication link . . . wherein each communication link is a twisted pair” and, as described in one embodiment of the specification, the central office terminal is then “coupled to one or more networks.” Specification ¶ 20. Hence, nothing in Crowe or Rawson teaches or suggests the “at least one communication link” between the central office terminal and the at least one remote access multiplexer as claimed in claim 28. For at least the reasons stated above, claim 28 is not obvious over Crowe in view of Rawson. Applicant respectfully requests that the rejection be withdrawn.

Claims 29-38 depend directly from claim 28 and, thus, are allowable for at least the reasons stated above with respect to claim 28. Applicant, therefore, requests that the rejections be withdrawn. In addition, with regards to claim 30, the Examiner acknowledges that Crowe “fails to specifically disclose that the at least one remote access multiplexer is located at a distance from the central office terminal so as to provide digital subscriber line service to user terminals that are located . . . between 12 and 30 kilo-feet from the central office terminal.” § 3. The Examiner refers to col. 3 lines 23-33 in Rawson and asserts that Rawson, “teaches the setup of remote access multiplexer being located at a distance from the central office terminal so as to

provide digital subscriber line service to user terminals that are located more than 12 kilo-feet from the central office terminal.” § 3.

However, col. 3 lines 23-33 state “Asymmetric DSL (ADSL) is another one of the DSL group of technologies, which allows such higher bandwidth connections. As an illustration, DMT-modulated ADSL technology can support bandwidth of 6.1 Mbps in the direction leaving the central office and 640 Kbps in the reverse direction. ADSL has the general requirements that *a location* connected with a local loop needs to be within 14,000 feet (approximately 3 miles) of the central office and that the local loop be a continuous metallic path (without electronic transmission equipment) end-to-end (i.e., from home to central office) to a location.” (emphasis added) Rawson continues at lines 34-35 by stating “Unfortunately, not all the *locations (homes and businesses)* meet both the requirements of ADSL.” (emphasis added) Hence, Rawson discusses “requirements that a location [i.e. homes and businesses] connected with a local loop needs to be within 14,000 feet of the central office.” Furthermore, Rawson states “In step 510, a provider installs one or more DSL access multiplexors (DSLAMs) 130 *in central office* 120.” col. 13 lines 23-24 see also Fig. 1. Hence, contrary to the Examiner’s assertion, Rawson does not teach or suggest “wherein the at least one remote access multiplexer is located at a distance from the central office terminal so as to provide digital subscriber line service to user terminals that are located between 12 and 30 kilofeet from the central office terminal” as claimed in claim 30. For the reasons stated above with regards to claim 28 and for the additional reasons stated here, Applicant requests that the rejection of claim 30 be withdrawn.

Claim 43:

A system for extending the effective distance of asymmetric digital subscriber line service, the system comprising:

- a central office terminal, the central office terminal including:
 - a data interface;
 - a telephony interface; and
 - a plurality of line units;

at least one communication link, coupled to one of the plurality of line units, that carries signals using single pair high speed digital subscriber line service, wherein each communication link is a twisted pair;

at least one remote access multiplexer, coupled to the at least one communication link, wherein the at least one remote access multiplexer includes a plurality of ports that are adapted to provide asymmetric digital subscriber line service;

the remote access multiplexer adapted to multiplex signals between the plurality of ports and the at least one communication link; and

wherein the at least one remote access multiplexer is located at a distance from the central office terminal so as to provide digital subscriber line service to user terminals that are located more than 12 kilofeet from the central office terminal.

Applicant asserts that nothing in Crowe or Rawson, taken alone or together, teaches all the claimed limitations of claim 43. In particular, nothing in Crowe or Rawson teaches or suggests “wherein each communication link is *a twisted pair*” (emphasis added). Additionally, Applicant asserts that nothing in Crowe or Rawson teaches or suggests, alone or in combination, that the “at least one communication link . . . carries signals using single pair high speed digital subscriber line service.” In the office action, the Examiner states that “Crowe et al. discloses . . . at least one remote access multiplexer (141).” § 3. In discussing the at least one communication link, the Examiner refers to “the connection between the DSL line card (209) and DSL CPR (107 and 131) and the connection between the DSL line card to the controller (215).” § 5. However, the at least one communication link claimed in claim 43 is coupled between “the at least one remote access multiplexer” and the “central office terminal”. Applicant asserts that nothing in Crowe or Rawson, teaches or suggests using “at least one communication link . . . that carries signals using single pair high speed digital subscriber line service” between the at least one remote access multiplexer and the central office terminal.

Furthermore, DSLAM 141 in Crowe is coupled directly to packet-switched network 119. Crowe, Figs. 1 and 2. However, the at least one remote access multiplexer claimed in claim 43 is coupled to the central office terminal via “at least one communication link . . . wherein each

communication link is a twisted pair” and, as described in one embodiment of the specification, the central office terminal is “coupled to one or more networks.” Specification ¶ 20. Hence, nothing in Crowe or Rawson teaches or suggests the “at least one communication link” between the central office terminal and the at least one remote access multiplexer as claimed in claim 43. For at least the reasons stated above, claim 43 is not obvious over Crowe in view of Rawson. Applicant respectfully requests that the rejection be withdrawn.

Claim 44 depends directly from claim 43 and, thus, is allowable for at least the reasons stated above with regards to claim 43. Applicant, therefore, requests that the rejection be withdrawn.

Claims 7 and 34 were rejected under 35 USC § 103(a) as being unpatentable over Crowe et al. (U.S. Patent No. 6,928,068) in view of Rawson et al. (U.S. Patent No. 6,028,867) in further view of Gerszberg et al. (U.S. Patent No. 5,970,473).

Claims 7 and 34 depend directly from claims I and 28, respectively and, thus, are allowable for at least the reasons stated above with regards to claims I and 28. In particular, Applicant asserts that nothing in Crowe, Rawson or Gerszberg, taken alone or in combination, teaches all of the claimed limitations as described above with regards to claims I and 28, respectively. Applicant, therefore, requests that the rejections be withdrawn.

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Title: IMPROVEMENTS TO DIGITAL SUBSCRIBER LINE SERVICES

CONCLUSION

Applicant respectfully submits that claims **1-11, 28-38, 43, 44** and **74** are in condition for allowance and notification to that effect is earnestly requested. If necessary, please charge any additional fees or credit overpayments to Deposit Account No. 502432.

If the Examiner has any questions or concerns regarding this application, please contact the undersigned at 612-332-4720.

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Respectfully submitted,



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